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Patent Case: ID01152 US

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re Application of: WEBER *et al.*

For:

HEPATITIS C VIRUS NS3 HELICASE FRAGMENTS

Application No.: 09/825,423

Filed: April, 3 2001

Examiner: Not yet assigned

Art Unit: Not yet assigned

Confirmation No.: 2057

Date: 12 January 2004

Schering-Plough Corporation Kenilworth, NJ 07033-0530

Mail Stop Petitions Commissioner for Patents P.O. Box 1450 Alexandria, VA 22313-1450

PETITION TO WITHDRAW HOLDING OF ABANDONMENT UNDER 37 C.F.R. §1.181

Sir:

Applicants request withdrawal of the November 28, 2003 Notice of Abandonment Under 37 C.F.R. §1.53(f) or (g) (hereafter "Notice of Abandonment") in the above-identified application. A copy of the Notice of Abandonment is enclosed at Exhibit A. In accordance with 37 C.F.R. §1.181(f), this petition is being filed within two months of the mail date of the Notice of Abandonment. Thus, this petition is timely filed.

The Notice of Abandonment states that the above-identified application is abandoned for failure to timely or properly reply to the Notice to File Missing Parts mailed December 5, 2001. The Notice of Abandonment states that no

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Signature

PTC/SB/21 (6-98)
Approved for use through 09/30/2000. OMB 0651-0031
Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE

valid Of	MB control number.	ct or rees, no pen	sons are required to respond to a	a collection of information unless it displays a				
			Application Number	09/825,423				
TR	ANSMITT	AL	Filing Date	April 3, 2001				
	FORM		First Named Inventor	Patricia C. WEBER				
(to be used for	all correspondence after	er initial filing)	Group Art Unit	Unassigned				
			Examiner Name	Unknown				
Total Number	of Pages in This Subm	issior 13	Attorney Docket Number	ID01152				
		ENCLOS	SURES (check all that app	ply)				
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Pan Pan	sponse to Missing ts under 37 CFR 2 or 1.53							
<u> </u>	SIGNATUR	RE OF APPLIC	CANT, ATTORNEY, OR A	GENT				
Firm or Individual name	Michael D. Davis		POINT, ATTORNET, OR A	IGEN.I.				
Signature	Signature Michael D. Davis							
Date	Date December 20, 2001							
		CERTIFICA	TE OF MAILING					
I hereby certify the envelope address	at this correspondence sed to: Assistant Comm	is being deposi	ited with the United States P ents, Washington, D.C. 2023	ostal Service as first class mail in an 31 on this dateDecember 20, 2001				
Typed or printed								

Burden Hour Statement: This form is estimated to take 0.2 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be send to the Chief Information Officer, Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231.

Date

December 20, 2001

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant(s):

Patricia C. Weber et al.

Group Unit: Unassigned

Serial No.

09/825,423

Examiner: Unknown

Filed

April 3, 2001

Date: December 20, 2001

For

HEPATITIS C VIRUS NS3 HELICASE FRAGMENTS

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to the Assistant Commissioner for Patents, Washington, DC. 20231 on

December 20, 2001
Date of Deposit

Michael D. Davis
Registered Representative

Signature & Date

Date of Deposit

_ _

Assistant Commissioner for Patents Washington, D.C. 20231

RESPONSE TO NOTICE TO COMPLY

Dear Sir:

In response to the Notice to Comply with Requirements for Patent Applications Containing Nucleotide Sequence and/or Amino Acid Sequence Disclosures, dated December 5, 2001, now due for response on February 5, 2002, and in accordance with 37 CFR 1.825 (a)-(g) the Applicants submit herewith a substitute computer readable copy of the Sequence Listing, a paper copy of the same, a Statement as required, and a copy of the Notice to Comply.

The undersigned hereby states that the content of the sequence information recorded in computer readable form is identical to the written (paper) Sequence Listing enclosed, and contains no new matter in accordance with 37 CFR 1.821 (e), (f) and (g) and 37 CFR 1.825 (b) and (d).

AUTHORIZATION

No fee is believed to be necessary, however, if the Applicants are mistaken, the Commissioner is hereby authorized to charge any fees which may be required for this response to Deposit Account No. 19-0365.

Respectfully submitted,

Michael D. Davis

Attorney for Applicant(s)

Registration No.: 39161

Telephone No.: (908) 298-2194

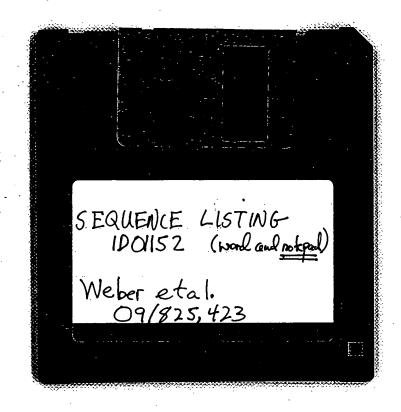
SCHERING-PLOUGH CORPORATION

Patent Department, K-6-1, 1990

2000 Galloping Hill Road

Kenilworth, New Jersey 07033-0530

Date: <u>December 20, 2001</u>



reply was received. Applicants file this petition because (1) applicants did not receive a December 5, 2001 Notice to File Missing Parts in the above-identified application; and (2) applicants timely and properly responded to a December 5, 2001 Notice to Comply with Requirements for Patent Applications Containing Nucleotide Sequence and/or Amino Acid Sequence Disclosures (hereafter "Notice to Comply"). Thus, applicants believe the application is not abandoned and the holding of abandonment should be withdrawn.

(1) Applicants' undersigned representative hereby states that a search of the application file jacket and the docket record for the appropriate time period indicates that a Notice to File Missing Parts mailed December 5, 2001 was not received by applicants. As there is a two-month period for reply set for a Notice to File Missing Parts, a copy of the docket record from December 5, 2001 to February 5, 2002 (pages 159-177 of the 3/9/00-9/16/02 Log In Book)¹ is submitted herewith at Exhibit B as documentary proof of nonreceipt of this Office Communication. See Manual Patent Examining Procedure 711.03(c)II.

(2) Applicants received a December 5, 2001 Notice to Comply (a copy of which is enclosed at Exhibit C), which stated that the computer readable form (CRF) was damaged and/or unreadable.² The Notice to Comply further stated that a substitute CRF and a statement that the content of the sequence listing information on the CRF is identical to the written sequence listing must be submitted. A response to the Notice to Comply was due February 5, 2002.

¹ Applicants have redacted the docket number, series number and first three digits of the application serial number of those cases not related to the above-identified application.

² Receipt of the Notice to Comply is noted on page 160 of the Log In Book (Exhibit B).

Applicants responded to the Notice to Comply on December 20, 2001 by first class mail bearing an executed Certificate of Mailing. Applicants enclosed (a) a transmittal letter, (b) a substitute CRF, (c) a substitute written (paper) Sequence Listing, (d) a Response to the Notice to Comply and (e) a postcard listing these enclosures (copies of (a)-(e) are enclosed at Exhibit D). The Response to the Notice to Comply included a statement that the content of the sequence information recorded in CRF was identical to the written Sequence Listing and contained no new matter.

Applicants received the postcard stamped January 24, 2002 by OIPE of the Patent and Trademark Office on February 4, 2002 (a copy of which is enclosed at Exhibit E), indicating that the Patent and Trademark Office received the Response to the Notice to Comply and its accompanying items. Thus, applicants believe that they timely and completely responded to the Notice to Comply and that this response was received by the Patent and Trademark Office.

For the above reasons, applicants respectfully request withdrawal of the holding of abandonment and subsequent prompt examination of the above-identified application.

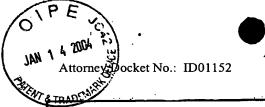
Respectfully submitted,

un E. Brown

Schering-Plough Corporation 2000 Galloping Hill Road Kenilworth, New Jersey 07033-0530 Karen E. Brown Reg. No. 43,866

Attorney for Applicants

(908) 298-2902



PTO/SB/92 (08-03) (Modified)

Application No.:09/825,423 Filing Date: 04/03/2001

Applicant: Patricia C. Weber, et al.

Title: HEPATITIS C VIRUS NS3 HELICASE FRAGMENTS

Certificate of Mailing under 37 CFR 1.8

I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to:

Commissioner for Patents P.O. Box 1450 Alexandria, VA 22313-1450 RECEIVED

JAN 2 0 2004

on January 12, 2004

Date

TECH CENTER 1600/2900

Signature

Karen E. Brown, Reg. No. 43,866

Typed or printed name of person signing Certificate

Note: Each paper must have its own certificate of mailing, or this certificate must identify each submitted paper.

Documents enclosed:

Petition to Withdraw Holding of Abandonment (3 pgs.) (attaching Exhibits A-E)

Certificate of Mailing (1 pg.)

Post Card

This collection of information is required by 37 CFR 1.8. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1.8 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.



UNITED STATES PATENT AND TRADEMARK OFFICE

COMMISSIONER FOR PATENTS
UNITED STATES PATENT AND TRADEMARK OFFICE
WASHINGTON, D.C. 2023I

APPLICATION NUMBER	FII DIO DECENTE		www.uspto.gov
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24265 SCHERING-PLOUGH CORF PATENT DEPARTMENT (K- 2000 GALLOPING HILL RO/ KENILWORTH, NJ 07033-05	PORATION DEC 16-1, 1990) AD 17E 16	*OCCOOCOCO	CONFIRMATION NO. 2057 ITIES LETTER 11 11 11 11 11 11 11 11 11 11 11 11 11
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NOTICE TO COMPLY WITH REQUIREMENTS FOR PATENT APPLICATIONS CONTAINING NUCLEOTIDE SEQUENCE AND/OR AMINO ACID SEQUENCE DISCLOSURES

Applicant is given **TWO MONTHS FROM THE DATE OF THIS NOTICE** within which to file the items indicated below to avoid abandonment. Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

• The computer readable form that has been filed with this application has been found to be damaged and/or unreadable as indicated on the attached CRF Diskette Problem Report. A substitute computer readable form must be submitted as required by 37 C.F.R. 1.825(d). Applicant must provide a substitute computer readable form (CRF) copy of the "Sequence Listing" and a statement that the content of the sequence listing information recorded in computer readable form is identical to the written (on paper or compact disc) sequence listing and, where applicable, includes no new matter, as required by 37 CFR 1.821(e), 1.821(f), 1.821(g), 1.825(b), or 1.825(d). If applicant desires the sequence listing in the instant application to be identical with that of another application on file in the U.S. Patent and Trademark Office, such request in accordance with 37 CFR 1.821(e) may be submitted in lieu of a new CRF.

For questions regarding compliance to these requirements, please contact:

- For Rules Interpretation, call (703) 308-4216
- To Purchase Patentin Software, call (703) 306-2600
- For Patentin Software Program Help, call (703) 306-4119 or e-mail at patin21help@uspto.gov or patin3help@uspto.gov

A copy of this notice MUST be returned with the reply.

Customer Service Center

Initial Patent Examination Division (703) 308-1202

PART 2 - COPY TO BE RETURNED WITH RESPONSE



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE United Status Patent and Trademark Office Address: COMMISSIONER FOR PATENTS P.O. Box 1450 Alexandria, Vuginia 22313-1450 www.uspto.gov

APPLICATION NUMBER FILING OR 371(C) DATE FIRST NAMED APPLICANT ATTY. DOCKET NO./TITLE

09/825,423

04/03/2001

Patricia C. Weber

ID01152

24265 SCHERING-PLOUGH CORPORATION PATENT DEPARTMENT (K-6-1, 1990) 2000 GALLOPING HILL ROAD KENILWORTH, NJ 07033-0530 CONFIRMATION NO. 2057
ABANDONMENT/TERMINATION
LETTER
OC000000011377562

Date Mailed: 11/28/2003

NOTICE OF ABANDONMENT UNDER 37 CFR 1.53 (f) OR (g)

The above-identified application is abandoned for failure to timely or properly reply to the Notice to File Missing Parts (Notice) mailed on 12/05/2001.

No reply was received.

A petition to the Commissioner under 37 CFR 1.137 may be filed requesting that the application be revived.

Under 37 CFR 1.137(a), a petition requesting the application be revived on the grounds of **UNAVOIDABLE DELAY** must be filed promptly after the applicant becomes aware of the abandonment and such petition must be accompanied by: (1) an adequate showing of the cause of unavoidable delay; (2) the required reply to the above-identified Notice; (3) the petition fee set forth in 37 CFR 1.17(I); and (4) a terminal disclaimer if required by 37 CFR 1.137(d).

Under 37 CFR 1.137(b), a petition requesting the application be revived on the grounds of **UNINTENTIONAL DELAY** must be filed promptly after applicant becomes aware of the abandonment and such petition must be accompanied by: (1) a statement that the entire delay was unintentional; (2) the required reply to the above-identified Notice; (3) the petition fee set forth in 37 CFR 1.17(m); and (4) a terminal disclaimer if required by 37 CFR 1.137(d).

Any questions concerning petitions to revive should be directed to the "Office of Petitions" at (703) 305-9282. Petitions should be mailed to: Mail Stop Petitions, Commissioner for Patents, P.O. Box 1450, Alexandria VA 22313-1450.

A copy of this notice MUST be returned with the reply.

Customer Service Center

Initial Patent Examination Division (703) 308-1202

PART 2 - COPY TO BE RETURNED WITH RESPONSE

OlPE

GRF:Problem Report

SYSTEMS
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The Scientific and Technical Information Center (STIC) experienced a problem when processing the following computer readable form (CRF):

Application Serial Number: 09/825,4232

Filing Date: / 4/

Date Processed by STIC: 2/8/2002

STIC Contact: Mark Spencer, 703-308-4212

Nature of Problem:

The/C	RF (was):
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	circle one) (Damaged or Unreadable (for Unreadable, see attached)
	Blank (no files on CRF) (see attached)
	Empty file (filename present, but no bytes in file) (see attached)
	Virus-infected. Virus name: The STIC will not process the CRF
	Not saved in ASCII text
	Sequence Listing was embedded in the file. According to Sequence Rules,
	submitted file should only be the Sequence Listing.
	Did not contain a Sequence Listing. (see attached sample)
	Other:
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PLEASE USE THE CHECKER VERSION 3.1 PROGRAM TO REDUCE ERRORS. SEE BELOW FOR ADDRESS:

http://www.uspto.gov/web/offices/pac/checker

Applicants submitting genetic sequence information electronically on diskette or CD-Rom should be aware that there is a possibility that the disk/CD-Rom may have been affected by treatment given to all incoming mail.

Please consider using alternate methods of submission for the disk/CD-Rom or replacement disk/CD-Rom.

Any reply including a sequence listing in electronic form should NOT be sent to the 20231 zip code address for the United States Patent and Trademark Office, and instead should be sent via the following to the indicated addresses:

- 1. EFS-Bio (http://www.uspto.gov/ebc/efs/downloads/documents.htm, EFS Submission User Manual ePAVE)
- 2. U.S. Postal Service: U.S. Patent and Trademark Office, Box Sequence, P.O. Box 2327, Arlington, VA 22202
- 3. Hand Carry directly to:

U.S. Patent and Trademark Office, Technology Center 1600, Reception Area, 7th Floor, Examiner Name, Sequence Information, Crystal Mall One, 1911 South Clark Street, Arlington, VA 22202

U.S. Patent and Trademark Office, Box Sequence, Customer Window, Lobby, Room 1B03, Crystal Plaza Two, 2011 South Clark Place, Arlington, VA 22202

4. Federal Express, United Parcel Service, or other delivery service to: U.S. Patent and Trademark Office, Box Sequence, Room 1B03-Mailroom, Crystal Plaza Two, 2011 South Clark Place, Arlington, VA 22202

Revised 01/29/2002

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www.uspto.gov APPLICATION NUMBER FILING/RECEIPT DATE FIRST NAMED APPLICANT PATENT DEPARTMENTICIA C. Weber ATTORNEY DOCKET NUMBER 09/825,423 04/03/2001 ID01152 RECEIVED **CONFIRMATION NO. 2057** 24265 DEC (, 0 2001 **FORMALITIES LETTER** SCHERING-PLOUGH CORPORATION: PATENT DEPARTMENT (K-6-1, 1990) 2000 GALLOPING HILL ROAD *OC000000007156208* KENILWORTH, NJ 07033-0530 PUTER INPUT Date Mailed: 12/05/2001

NOTICE TO COMPLY WITH REQUIREMENTS FOR PATENT APPLICATIONS CONTAINING NUCLEOTIDE SEQUENCE AND/OR AMINO ACID SEQUENCE DISCLOSURES

Applicant is given **TWO MONTHS FROM THE DATE OF THIS NOTICE** within which to file the items indicated below to avoid abandonment. Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

• The computer readable form that has been filed with this application has been found to be damaged and/or unreadable as indicated on the attached CRF Diskette Problem Report. A substitute computer readable form must be submitted as required by 37 C.F.R. 1.825(d). Applicant must provide a substitute computer readable form (CRF) copy of the "Sequence Listing" and a statement that the content of the sequence listing information recorded in computer readable form is identical to the written (on paper or compact disc) sequence listing and, where applicable, includes no new matter, as required by 37 CFR 1.821(e), 1.821(f), 1.821(g), 1.825(b), or 1.825(d). If applicant desires the sequence listing in the instant application to be identical with that of another application on file in the U.S. Patent and Trademark Office, such request in accordance with 37 CFR 1.821(e) may be submitted in lieu of a new CRF.

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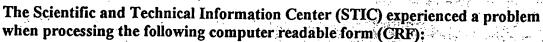
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Methode 5,2002





Application Serial Number: 09/825,423A

Filing Date: 4/3/2001

Date Processed by STIC: 7/17/2001

STIC Contact: Mark Spencer, 703-308-4212

Nature of Problem:

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The Checker Version 3.0 application is a state-of the-art Windows based software program employing a logical and intuitive user-interface to check whether a sequence listing is in compliance with format and content rules. Checker Version 3.0 works for sequence listings generated for the original version of 37 CFR §§1.821 – 1.825 effective October 1, 1990 (old rules) and the revised version (new rules) effective July 1, 1998 as well as World Intellectual Property Organization (WIPO) Standard ST.25.

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Checker Version 3.0 can be down loaded from the USPTO website at the following address: http://www.uspto.gov/web/offices/pac/checker

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Applicant: Patricia C. WEBER et al.
Serial No.: 09/825,423 Atty: MDD/1m
Filed: April 3, 2001 Case No: ID01152
For: HEPATITIS C VIRUS NS3 HELICASE FRAGMENTS
Enclosed:
[] Application papers comprising:
[] Request for Filing Provisional Appln.
Request for Filing Patent Appln.
pages of Specification
pages of Claims
pages of Abstract
sheets of Drawing (formal/informal)
[] Declaration/Power of Attorney
XXTransmittal letter (1 pg)
1 Amendment
[] Notice of Appeal
I J Appeal Brief (in triplicate)
I Petition for Extension of Time
[] Preliminary Amendment
Information Disclosure Statement
Form PTO 1449
[] References
KKResponse To Notice To Comply (2 pgs)
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in the amount of \$
KI Copy of Notice To Comply (1 pg)
KI Computer Readable copy of Sequence Listing
KIWritten (paper) Copy of Sequence Listing (9pg)
Date Mailed: December 20, 2001
Express Mail Label No.:

SEQUENCE LISTING

<110> Weber, Patricia C.
 Reichert, Paul
 Madison, Vincent S.
 Wyss, Daniel
 Yao, Nanhua
 Liu, Dingjiang
 Gesell, Jennifer

<120> Hepatitis C Virus NS3 Helicase Fragments

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<150> US 60/194,419 <151> 2000-04-04

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Val Gln Ile Val Ser Thr Ala Thr Gln Thr Phe Leu Ala Thr Cys Ile 35 40 45

Asn Gly Val Cys Trp Thr Val Tyr His Gly Ala Gly Thr Arg Thr Ile
50 55 60

Ala Ser Pro Lys Gly Pro Val Ile Gln Met Tyr Thr Asn Val Asp Gln 65 70 75 80

Asp Leu Val Gly Trp Pro Ala Pro Gln Gly Ser Arg Ser Leu Thr Pro 85 90 95

Cys Thr Cys Gly Ser Ser Asp Leu Tyr Leu Val Thr Arg His Ala Asp 100 105 110

Val Ile Pro Val Arg Arg Gly Asp Ser Arg Gly Ser Leu Leu Ser 115 120 125

Pro Arg Pro Ile Ser Tyr Leu Lys Gly Ser Ser Gly Gly Pro Leu Leu 130 135 140

Cys Pro Ala Gly His Ala Val Gly Leu Phe Arg Ala Ala Val Cys Thr 145 150 155 160

Arg Gly Val Thr Lys Ala Val Asp Phe Ile Pro Val Glu Asn Leu Glu

165 170

175 Thr Thr Met Arg Ser Pro Val Phe Thr Asp Asn Ser Ser Pro Pro Ala 180 185 Val Pro Gln Ser Phe Gln Val Ala His Leu His Ala Pro Thr Gly Ser Gly Lys Ser Thr Lys Val Pro Ala Ala Tyr Ala Ala Gln Gly Tyr Lys Val Leu Val Leu Asn Pro Ser Val Ala Ala Thr Leu Gly Phe Gly Ala 230 235. Tyr Met Ser Lys Ala His Gly Val Asp Pro Asn Ile Arg Thr Gly Val 250 Arg Thr Ile Thr Thr Gly Ser Pro Ile Thr Tyr Ser Thr Tyr Gly Lys Phe Leu Ala Asp Gly Gly Cys Ser Gly Gly Ala Tyr Asp Ile Ile 280 Cys Asp Glu Cys His Ser Thr Asp Ala Thr Ser Ile Leu Gly Ile Gly Thr Val Leu Asp Gln Ala Glu Thr Ala Gly Ala Arg Leu Val Val Leu 310 Ala Thr Ala Thr Pro Pro Gly Ser Val Thr Val Pro His Pro Asn Ile 325 Glu Glu Val Ala Leu Ser Thr Thr Gly Glu Ile Pro Phe Tyr Gly Lys Ala Ile Pro Leu Glu Val Ile Lys Gly Gly Arg His Leu Ile Phe Cys 355 His Ser Lys Lys Cys Asp Glu Leu Ala Ala Lys Leu Val Ala Leu Gly Ile Asn Ala Val Ala Tyr Tyr Arg Gly Leu Asp Val Ser Val Ile 395 Pro Thr Asn Gly Asp Val Val Val Ala Thr Asp Ala Leu Met Thr Gly Phe Thr Gly Asp Phe Asp Ser Val Ile Asp Cys Asn Thr Cys Val 420 425 Thr Gln Thr Val Asp Phe Ser Leu Asp Pro Thr Phe Thr Ile Glu Thr 440 Thr Thr Leu Pro Gln Asp Ala Val Ser Arg Thr Gln Arg Arg Gly Arg 455 Thr Gly Arg Gly Lys Pro Gly Ile Tyr Arg Phe Val Ala Pro Gly Glu Arg Pro Ser Gly Met Phe Asp Ser Ser Val Leu Cys Glu Cys Tyr Asp

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Ala Gly Cys Ala Trp Tyr Glu Leu Thr Pro Ala Glu Thr Thr Val Arg
500 505 510

Leu Arg Ala Tyr Met Asn Thr Pro Gly Leu Pro Val Cys Gln Asp His 515 520 525

Leu Glu Phe Trp Glu Gly Val Phe Thr Gly Leu Thr His Ile Asp Ala 530 535 540

His Phe Leu Ser Gln Thr Lys Gln Ser Gly Glu Asn Phe Pro Tyr Leu 545 550 555 560

Val Ala Tyr Gln Ala Thr Val Cys Ala Arg Ala Gln Ala Pro Pro Pro 565 570 575

Ser Trp Asp Gln Met Trp Lys Cys Leu Ile Arg Leu Lys Pro Thr Leu
580 585 590

His Gly Pro Thr Pro Leu Leu Tyr Arg Leu Gly Ala Val Gln Asn Glu
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<212> PRT

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Val Pro Gln Ser Phe Gln Val Ala His Leu His Ala Pro Thr Gly Ser 20 25 30

Gly Lys Ser Thr Lys Val Pro Ala Ala Tyr Ala Ala Gln Gly Tyr Lys
35 40 45

Val Leu Val Leu Asn Pro Ser Val Ala Ala Thr Leu Gly Phe Gly Ala 50 55 60

Tyr Met Ser Lys Ala His Gly Val Asp Pro Asn Ile Arg Thr Gly Val 65 70 75 80

Arg Thr Ile Thr Thr Gly Ser Pro Ile Thr Tyr Ser Thr Tyr Gly Lys 85 90 95

Phe Leu Ala Asp Gly Gly Cys Ser Gly Gly Ala Tyr Asp Ile Ile Ile 100 105 110

Cys Asp Glu Cys His Ser Thr Asp Ala Thr Ser Ile Leu Gly Ile Gly 115 120 125

Thr Val Leu Asp Gln Ala Glu Thr Ala Gly Ala Arg Leu Val Val Leu 130 135 140

Ala Thr Ala Thr 145

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1 5 10 15

Val Ala Leu Ser Thr Thr Gly Glu Ile Pro Phe Tyr Gly Lys Ala Ile 20 25 30

Pro Leu Glu Val Ile Lys Gly Gly Arg His Leu Ile Phe Cys His Ser 35 40 45

Lys Lys Cys Asp Glu Leu Ala Ala Lys Leu Val Ala Leu Gly Ile 50 55 60

Asn Ala Val Ala Tyr Tyr Arg Gly Leu Asp Val Ser Val Ile Pro Thr 65 70 75 80

Asn Gly Asp Val Val Val Val Ala Thr Asp Ala Leu Met Thr Gly Phe
85 90 95

Thr Gly Asp Phe Asp Ser Val Ile Asp Cys Asn Thr Ser Asp Gly Lys
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Pro Gln Asp Ala Val Ser Arg Thr Gln Arg Arg Gly Arg Thr Gly Arg 115 120 125

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- Val Pro Gln Ser Phe Gln Val Ala His Leu His Ala Pro Thr Gly Ser
- Gly Lys Ser Thr Lys Val Pro Ala Ala Tyr Ala Ala Gln Gly Tyr Lys
- Val Leu Val Leu Asn Pro Ser Val Ala Ala Thr Leu Gly Phe Gly Ala
- Tyr Met Ser Lys Ala His Gly Val Asp Pro Asn Ile Arg Thr Gly Val
- Arg Thr Ile Thr Thr Gly Ser Pro Ile Thr Tyr Ser Thr Tyr Gly Lys
- Phe Leu Ala Asp Gly Gly Cys Ser Gly Gly Ala Tyr Asp Ile Ile Ile
- Cys Asp Glu Cys His Ser Thr Asp Ala Thr Ser Ile Leu Gly Ile Gly 120
- Thr Val Leu Asp Gln Ala Glu Thr Ala Gly Ala Arg Leu Val Val Leu 135
- Ala Thr Ala Thr Pro Pro Gly Ser Val Thr Val Pro His Pro Asn Ile 150
- Glu Glu Val Ala Leu Ser Thr Thr Gly Glu Ile Pro Phe Tyr Gly Lys 175
- Ala Ile Pro Leu Glu Val Ile Lys Gly Gly Arg His Leu Ile Phe Cys
- His Ser Lys Lys Lys Cys Asp Glu Leu Ala Ala Lys Leu Val Ala Leu 205
- Gly Ile Asn Ala Val Ala Tyr Tyr Arg Gly Leu Asp Val Ser Val Ile
- Pro Thr Asn Gly Asp Val Val Val Ala Thr Asp Ala Leu Met Thr 225 235
- Gly Phe Thr Gly Asp Phe Asp Ser Val Ile Asp Cys Asn Thr Ser Asp
- Gly Lys Pro Gln Asp Ala Val Ser Arg Thr Gln Arg Arg Gly Arg Thr 265
- Gly Arg Gly Lys Pro Gly Ile Tyr Arg Phe Val Ala Pro Gly Glu Arg 280

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Gly Lys Ser Thr Lys Val Pro Ala Ala Tyr Ala Ala Gln Gly Tyr Lys
35 40 45

Val Leu Val Leu Asn Pro Ser Val Ala Ala Thr Leu Gly Phe Gly Ala 50 55 60

Tyr Met Ser Lys Ala His Gly Val Asp Pro Asn Ile Arg Thr Gly Val 65 70 75 80

Arg Thr Ile Thr Thr Gly Ser Pro Ile Thr Tyr Ser Thr Tyr Gly Lys
85 90 95

Phe Leu Ala Asp Gly Gly Cys Ser Gly Gly Ala Tyr Asp Ile Ile Ile 100 105 110

Cys Asp Glu Cys His Ser Thr Asp Ala Thr Ser Ile Leu Gly Ile Gly
115 120 125

Thr Val Leu Asp Gln Ala Glu Thr Ala Gly Ala Arg Leu Val Val Leu 130 135 140

Ala Thr Ala Thr Pro Pro Gly Ser Gly Met Phe Asp Ser Ser Val Leu 145 150 155 160

Cys Glu Cys Tyr Asp Ala Gly Cys Ala Trp Tyr Glu Leu Thr Pro Ala 165 170 175

Glu Thr Thr Val Arg Leu Arg Ala Tyr Met Asn Thr Pro Gly Leu Pro 180 185 190

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Asn Phe Pro Tyr Leu Val Ala Tyr Gln Ala Thr Val Cys Ala Arg Ala 225 230 235 240

Gln

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Gln Gly Gly Ala
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Arg Gly Ser Thr
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Arg Gly Pro Gly
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Cys Asp Gly Leu
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